

Application No.: 10/572,377
Art Unit: 1791

Amendment under 37 C.F.R. §1.111
Attorney Docket No.: 062284

AMENDMENTS TO THE DRAWINGS

The attached replacement sheets of drawings include changes to Figs.1-6.

REMARKS

Objection to Drawings

The drawings are objected to under 37 CFR 1.81(c).

Replacement sheets of the drawings of Figs.1-6 are submitted herewith.

Rejections under 35 USC §102(b)

Claims 1, 4, 7 and 9 were rejected under 35 USC §102(b) as being anticipated by Verville (U.S. Patent No. 5,186,781, herein “Verville”).

Claim 1 has been amended to recite “wherein an amount of the adhesive is held constant by controlling an air pressure higher than an atmospheric pressure for pushing out the adhesive.”

Regarding the applicator, Verville describes as follows:

The structure of the applicator 28 is shown in FIG. 2. In the illustrated preferred form, the applicator 28 is similar in appearance and size to a hypodermic syringe and needle. The applicator 28 includes a container 30 having a supply of fluid adhesive 32 therein. A top 34 of the container 30 has a vent opening 36 therethrough, so that the adhesive 32 is maintained at ambient (existing atmospheric) pressure. That is, in this preferred applicator no external pressure is applied to the adhesive, nor is the pressure of the adhesive permitted to fall below ambient pressure as adhesive is removed from the container 30. There is also an adhesive fill tube 37 in the top of the container 30, whereby additional fluid adhesive may be added to the container 30 while it continues to operate.

(Verville, column 4, lines 13-27). Thus, in Verville, adhesive is maintained at atmospheric pressure. According to such structure, however, the deficient amount of the adhesive is not avoided to cause peeling-off of the optical fiber, as well as the excessive amount of the adhesive

to cause wasteful use of the adhesive and extra spreading of the adhesive over the surface of the substrate.

In contrast, according to the present invention, an amount of the adhesive is held constant by controlling an air pressure higher than an atmospheric pressure for pushing out the adhesive. Thus, the air pressure for pushing out the adhesive 14 is controlled by the controller 10. When the optical fiber 3 is wired in a linear shape, the air pressure for pushing out the adhesive 14 is raised to eject a relatively large amount of the adhesive 14. Also, when the optical fiber 3 is wired in a curved shape along a corner or the like, the air pressure for pushing out the adhesive 14 is lowered to eject a relatively small amount of the adhesive 14.

With that control, the amount of the adhesive 14 applied to the optical fiber 3 can be kept constant regardless of whether the optical fiber 3 is wired in a linear shape or a curved shape. It is therefore possible to eliminate drawbacks caused when the optical fiber 3 is bonded onto the substrate 6, i.e., to avoid peeling-off of the optical fiber 3 due to the deficient amount of the adhesive 14, as well as wasteful use of the adhesive 14 and extra spreading of the adhesive 14 over the surface of the substrate 6 due to the excessive amount of the adhesive 14.

Thus, Verville does not teach or suggest “wherein an amount of the adhesive is held constant by controlling an air pressure higher than an atmospheric pressure for pushing out the adhesive.”

The examiner alleged that bobbin (14) in Verville is equivalent to the substrate. However, a person of ordinary skill in the art would not think the bobbin is equivalent to the substrate. Verville discloses “a process for winding an optical fiber” (column 2, lines 11-12) but

it does not discloses a process for optical wiring on a surface of a substrate. That is, the uses of Verville and the present invention are entirely different from each other.

For at least these reasons, claim 1 patentably distinguishes over Verville. Claim 4, depending from claim 1 also patentably distinguishes over Verville for at least the same reasons.

Claim 7 similarly recites “a controller to control an air pressure higher than an atmospheric pressure for pushing out the adhesive.” Verville does not teach or suggest the recitation.

For at least these reasons, claim 7 patentably distinguishes over Verville. Claim 9, depending from claim 7 also patentably distinguishes over Verville for at least the same reasons.

Rejections under 35 USC §103(a)

Claims 1, 3, 6, 7 and 8 were rejected under 35 USC §103(a) as being obvious over Hirayama et al. (U.S. Patent No. 6,778,754, herein “Hirayama”) in view of Verville .

The Examiner alleged as follows:

Verville teaches continuously coating adhesive onto an optical fiber as the optical fiber passes though the adhesive applicator, which allows for the application of a controllable and uniform coating of adhesive. Verville teaches the improved adhesive application method climates uneven adhesive application and speeds up the process by continuously applying the optical fiber to the substrate (column 2, lines 1 1-67).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Hirayama by using an adhesive application process that involves passing the optical fiber though an adhesive applicator as taught by Verville in order to provide better control over the amount of adhesive used and applied.

(Office Action, page 4, lines 4-13).

As discussed above, claim 1 has been amended to recite "wherein an amount of the adhesive is held constant by controlling an air pressure higher than an atmospheric pressure for pushing out the adhesive."

Claim 7 similarly recites "a controller to control an air pressure higher than an atmospheric pressure for pushing out the adhesive." Verville does not teach or suggest these recitations.

Verville and Hirayama do not teach or suggest these recitations. For at least these reasons, claims 1 and 7 patentably distinguish over Verville and Hirayama. Claims 3 and 6, depending from claim 1, and claim 8, depending from claim 7 also patentably distinguish over Verville and Hirayama for at least the same reasons.

Hirayama states as follows: "an optical fiber wiring substrate was employed which had an adhesive layer on the surface thereof; however, this is not necessarily so limited, and the following methods may also be adopted" (Hirayama, column 27, lines 40-43). Hirayama further describes methods which teach away from the present invention, as follows:

- a) A structure (method) in which, in the optical fiber wiring apparatus, an adhesive application apparatus (optical fiber affixing mechanism) is provided in the vicinity of the wiring head, and when the optical fiber to be wired is wired, adhesive is applied to the wiring substrate
- b) A structure in which an adhesive (optical fiber affixing mechanism) is provided in advance on the optical fibers to be wired themselves.

The methods a) and b) do not disclose with respect to applying the adhesive over the surface of the moving optical fiber. In Hirayama, the optical fiber moving through the nozzle is delivered while it is contacting with the inner periphery of the wiring head (835) (see Fig. 9 in

Hirayama), and the pre-applied layer of adhesive is wiped away by the wiring head (835). Thus, the combination of Verville and Hirayama does not teach the method of wiring an optical fiber circuit on the surface of a substrate.

In contrast, according to the present invention, the above-mentioned problem can be avoided because the method includes the steps of “simultaneously ejecting the optical fiber and the adhesive” through the ejecting nozzle. Furthermore, by “controlling an air pressure higher than an atmospheric pressure for pushing out the adhesive” the method can give unpredictable results of “an amount of the adhesive is held constant.”

For at least these reasons, Claims 1 and 7 patentably distinguish over Verville and Hirayama. Claims 3, and 6, depending from Claim 1, also patentably distinguishes over Verville and Hirayama for at least the same reasons. Claim 8, depending from Claim 7, also patentably distinguishes over Verville and Hirayama for at least the same reasons.

It also should be noted that Japanese Patent Application No. 2003-325087, the priority of which is claimed in the present application, was already registered as Japanese Patent No. 3998204 on August 17, 2007.

Claims 2, 6, 10 and 11 were rejected under 35 USC §103(a) as being obvious over Hirayama and Verville and further in view of Keyworth et al. (U.S. Patent No. 5,534,101, herein “Keyworth”).

Claims 2 and 6 depend from claim 1, and claims 10 and 11 depend from 7. As discussed above, claims 1 and 7 patentably distinguish over Hirayama and Verville.

Keyworth has been cited for allegedly disclosing controlling the amount of air pressure applied in the nozzle to control the amount of UV curable liquid being dispensed. However, Keyworth discusses method and apparatus for making optical components by direct dispensing of curable liquid, and the curable liquid is not used to fix optical fibers. Moreover, Keyworth does not teach or suggest the combination of controlling the speed at which the optical fiber is introduced and controlling the air pressure for pushing out the adhesive. Thus, Keyworth does not remedy the deficiencies of Hirayama and Verville discussed above.

For at least these reasons, claims 2, 6, 10 and 11 patentably distinguish over Hirayama, Verville and Keyworth.

Claims 4 and 9 are rejected under 35 USC §103(a) as being obvious over Hirayama and Verville and further in view of Swiggett et al. (U.S. Patent No. 4,693,778, herein “Swiggett”).

Claim 4 depends from claim 1, and claim 9 depends from 7. As discussed above, claims 1 and 7 patentably distinguish over Hirayama and Verville.

Swiggett has been cited for allegedly disclosing a method and apparatus for applying conductors to a substrate and further disclosing relative movement between a dispenser and a substrate which is caused by either fixing the substrate and moving the dispenser, or fixing the dispenser and moving the substrate. Such disclosure of Swiggett, however, does not remedy the deficiencies of Hirayama and Verville discussed above.

For at least these reasons, claims 2, 6, 10 and 11 patentably distinguish over Hirayama, Verville and Swiggett.

Claim 5 is rejected under 35 USC §103(a) as being obvious over Hirayama and Verville and further in view of Hawkins (U.S. Patent No. 3,742,107, herein “Hawkins”).

Claim 5 depends from claim 1. As discussed above, claim 1 patentably distinguishes over Hirayama and Verville.

Hawkins has been cited for allegedly disclosing that optic fibers can be used and they have benefit of increased strength and flexibility compared with glass fibers. Such disclosure of Hawkins, however, does not remedy the deficiencies of Hirayama and Verville discussed above.

For at least these reasons, claim 5 patentably distinguishes over Hirayama, Verville and Hawkins.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants’ undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



Sadao Kinashi
Attorney for Applicants
Registration No. 48,075
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

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Attachment: Replacement Sheets for Figs.1-6